

# How Physicians and Nursing Staff Perceive Effectiveness and Tolerability of *Bryophyllum* Preparations: An Online Survey in an Anthroposophic Hospital

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## Keywords

*Bryophyllum* · *Kalanchoe* · Anthroposophic medicine · Mental health

## Abstract

**Background:** *Bryophyllum* preparations are widely used in anthroposophic medicine, most often for mental and behavioural disorders. Three prospective studies have revealed positive effects of *Bryophyllum pinnatum* on sleep quality, and various trials have shown very good tolerability. Results from animal models have indicated CNS depressant and anxiolytic effects. This survey was conducted at the hospital "Klinik Arlesheim" in Switzerland to find out how the physicians and the nursing staff perceive the effectiveness and the tolerability of the *Bryophyllum* preparations they most frequently use. **Design:** Internal, anonymous online survey of healthcare professionals (April 8–May 31, 2022). The questionnaire comprised 105 multiple-choice questions. Answering the questions was taken as consent to participate in the survey. **Participants and Methods:** All physicians and nursing staff with a valid email address at the hospital "Klinik Arlesheim AG" were invited via email to participate in this REDCap survey. The data were analysed descriptively. **Results:** Out of 266 invited participants, 48 answered some and 36 answered all questions (response rate between 18.0% and 13.5%). The participants had long experience with *Bryophyllum* preparations and

were comprised approximately equal numbers of physicians and nursing staff. Various *Bryophyllum* preparations from the hospital's own production and Wala Heilmittel GmbH (in both cases produced from the species *B. daigremontianum*) and from Weleda AG (species *B. pinnatum*) were used. The indications for which most participants had prescribed or administered *Bryophyllum* preparations "very frequently" were anxiety, sleep disorders, crisis situations in oncology, post-traumatic stress disorder, benzodiazepine dependence/withdrawal, and depression. Improvements such as relief from restlessness, decreased anxiety, balance, easier falling asleep, better sleeping through, increased resilience, mood elevation, and less urge to move one's legs were reported "frequently" or "very frequently." Almost all participants agreed that *Bryophyllum* can be used to reduce the intake of synthetic sedatives or psychotropic drugs, but only approximately half believed that it could replace them. The majority of participants mentioned good tolerability of the various products, but a few reported occasional stomach or intestinal irritation, daytime fatigue, drowsiness, diarrhoea, and nausea. **Conclusion:** *Bryophyllum* preparations are perceived as helpful in the treatment of various mental disorders, particularly anxiety, and are generally well tolerated. Most of these preparations are used for indications that have not yet been clinically investigated.

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## Wie Ärztinnen und Ärzte sowie das Pflegepersonal die Wirksamkeit und Verträglichkeit von *Bryophyllum*-Präparaten wahrnehmen: Eine Online-Befragung in einem anthroposophischen Krankenhaus

### Schlüsselwörter

*Bryophyllum* · *Kalanchoe* · Anthroposophische Medizin · Psychische Gesundheit

### Zusammenfassung

**Hintergrund:** *Bryophyllum*-Präparate werden in der Anthroposophischen Medizin sehr häufig zur Behandlung von psychischen und Verhaltensstörungen eingesetzt. Drei prospektive Studien zeigten zudem positive Wirkungen von *Bryophyllum pinnatum* (BP) auf die Schlafqualität. Auch die Verträglichkeit wurde in allen bisherigen Studien als sehr gut bewertet. In Tiermodellen wurden ZNS-depressive und anxiolytische Effekte von BP festgestellt. Die hier durchgeführte Umfrage fand an der Klinik Arlesheim (Schweiz) statt. Sie diente dazu herauszufinden, wie Ärztinnen und Ärzte sowie das Pflegepersonal die Wirksamkeit und Verträglichkeit der von ihnen am häufigsten verwendeten *Bryophyllum*-Präparate wahrnehmen. **Design:** Interne, anonyme, Online-Befragung unter ärztlichen und pflegerischen Fachkräften (8. April–31. Mai 2022). Der Fragebogen umfasste 105 Multiple-Choice-Fragen. Die Beantwortung der Fragen wurde als Zustimmung zur Teilnahme an der Umfrage interpretiert. **Teilnehmende und Methoden:** Alle Ärztinnen, Ärzte und Pflegefachpersonen mit einer gültigen E-Mail-Adresse der "Klinik Arlesheim AG" wurden per E-Mail eingeladen, an dieser REDCap-Umfrage teilzunehmen. Die Daten wurden deskriptiv ausgewertet. **Ergebnisse:** Von den 266 eingeladenen Teilnehmenden beantworteten 48 einige und 36 alle Fragen (Antwortquote zwischen 18.0% und 13.5%). Die Teilnehmenden hatten langjährige Erfahrung mit *Bryophyllum*-Präparaten und setzten sich etwa zu gleichen Teilen aus ärztlichen und pflegerischen Fachkräften zusammen. Die Resultate zeigen, dass verschiedenste *Bryophyllum*-Präparate aus klinikeigener Herstellung, von der Wala Heilmittel GmbH (Art *B. daigremontianum*) und von der Weleda AG (Art *B. pinnatum*) verwendet werden. Zu den Indikationen, bei denen die meisten Teilnehmenden *Bryophyllum*-Präparate "sehr häufig" verordnet oder angewendet haben, gehören Angstzustände, Schlafstörungen, Krisensituationen in der Onkologie, Posttraumatische Belastungsstörung, Benzodiazepin-Abhängigkeit/Entzug und Depressionen. Gesundheitsverbesserungen wie Linderung von Unruhe, verminderte Angst, Ausgeglichenheit, leichteres Einschlafen, besseres Durchschlafen, erhöhte Belastbarkeit, Stimmungsaufhellung und weniger Drang, die Beine zu bewegen, wurden als "häufig" oder "sehr häufig" angegeben. Fast alle Teilnehmenden waren sich einig, dass

*Bryophyllum* verwendet werden kann, um die Einnahme von synthetischen Beruhigungsmitteln oder Psychopharmaka zu reduzieren, aber nur etwa die Hälfte gab an, dass es diese ersetzen kann. Die Mehrheit der Teilnehmenden spricht von einer guten Verträglichkeit der verschiedenen Produkte. Einige wenige berichteten von gelegentlicher Magen- oder Darmreizung, Tagesmüdigkeit, Schläfrigkeit, Durchfall und Übelkeit. **Schlussfolgerung:** *Bryophyllum*-Präparate werden als hilfreich bei der Behandlung verschiedener psychischen Störungen, insbesondere bei Angstzuständen, angesehen und im Allgemeinen gut vertragen. Die meisten der angegebenen Präparate werden für Indikationen verwendet, die noch nicht klinisch untersucht worden sind.

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### Introduction

*Bryophyllum* plants are succulent perennial plants (Crassulaceae) that originated in Madagascar. They now grow in many tropical and subtropical areas of Africa, America, and Asia, where they are used in ethnomedicine. One of the *Bryophyllum* species, *B. pinnatum*, was introduced in anthroposophic medicine during the 1920s [1]; thereafter, *B. daigremontianum* also began to be used in this type of integrative medicine [2].

In the 1970s, *B. pinnatum* preparations started to be used in the treatment of preterm labour in a German anthroposophic hospital [3, 4]; they are now widely used in Switzerland in obstetrics and gynaecology [5]. Clinical studies have shown *B. pinnatum* to be effective in treating premature labour [6], hyperactive bladder [7], and nocturia [8]. These clinical effects are supported by data obtained using various in vitro models (see, e.g., [9–11]).

In 2010, *Bryophyllum* preparations were already frequently used by anthroposophic physicians in Germany for the treatment of mental and behavioural disorders such as sleep disorders, anxiety, and depressive symptoms [2]. Since then, three prospective trials and one case series reported improved sleep quality during treatment with *B. pinnatum* (50% chewable tablets): during pregnancy [12], in cancer [13], associated with restless legs syndrome [14] and with nocturia [8]. Although little is known about possible mechanisms of action that would support its use in the treatment of mental and behavioural disorders, some results from animal models support a CNS depressant action, as well as sedative and anxiolytic effects [15–17]. *Bryophyllum* species contain several pharmacologically active compounds [1], including bufadienolides, which have been suggested to be responsible for the sedative effects [18].

The "Klinik Arlesheim AG" is an 82-bed acute hospital for anthroposophic medicine in the specialities of internal

medicine (with a focus on gastroenterology, cardiology, neurology, and pneumology), oncology and psychiatry/psychosomatics, as well as many outpatient treatments. The hospital takes a holistic approach that complements conventional medicine in the diagnosis, treatment, care, and therapy of patients. It was the first centre for anthroposophic medicine in the world and is currently the only one in Switzerland. In addition to conventional medicines, physicians have access to a wide range of complementary medicines produced in-house and by companies specialised in anthroposophic pharmacy. The nursing staff is trained to administer these preparations to inpatients.

Accounting data from the pharmacy of the hospital "Klinik Arlesheim AG" indicate that a variety of *Bryophyllum* preparations have been prescribed to inpatients. In this study, we conducted a survey to assess the perception of effectiveness and tolerability of *Bryophyllum* preparations by physicians and nursing staff working at the hospital "Klinik Arlesheim AG."

## Methods

### Study Design

This analysis is based on reported data from physicians and nursing staff who participated in an anonymous online survey on REDCap between April 8, 2022, and May 31, 2022.

### Selection and Description of Participants

The survey was conducted in the "Klinik Arlesheim AG." All physicians and nursing staff who had a valid email address at this hospital were invited via internal email to participate in the survey on REDCap [19, 20]. Voluntarily answering the questions was taken as consent to participate in the survey under the given conditions.

### Questionnaire

The questionnaire comprised 105 multiple-choice questions and was available in German only. To ensure readability and clarity of the questions, the questionnaire was pilot tested by three of the authors before it was made available online.

The first three questions of the questionnaire focused on the sociodemographic characteristics of the participants. The subsequent 45 questions were related to the frequency of use of specific *Bryophyllum* preparations and could be answered with "never," "rarely," "occasionally," "frequently," or "very frequently." The next seven questions concerned the general tolerability of different application forms of *Bryophyllum*; possible answers were "bad," "rather good," "good," "very good," and "I don't know." Thereafter, the participants were asked the question: "How often have you administered *Bryophyllum* for the following diagnoses or symptoms"; 14 diagnoses and 14 symptoms were listed, with response options being "never," "rarely," "occasionally," "frequently," or "very frequently." Subsequent questions concerned the observed improvements in patients after administration (eight items; possible answers: "never," "rarely," "occasionally," "frequently," "very frequently," and "I don't know") and how often side effects occur (12 items; possible answers: "never," "rarely," "occasionally," "frequently," or "very frequently"). Finally, participants were asked whether they believed that *Bryophyllum* could

**Table 1.** Characteristics of survey participants ( $n = 48$ ), expressed as the number of respondents

How many years have you been working with <i>Bryophyllum</i> preparations?	
<1	4
1–5	11
6–10	11
11–20	15
>20	7
To which professional group do you belong?	
Physicians	24
Nurses	24
In which department do you or have you worked? (Several answers possible)	
Psychiatry/psychosomatics	23
Oncology	21
Outpatient services	21
Internal medicine	19

potentially replace or reduce the administration of chemical sedatives or psychotropic drugs, with response options "yes" or "no."

To maintain anonymity, the survey did not include questions about names or other identifying information, and all participants received the same access link to the survey. Sociodemographic questions were limited to the participant's professional group (physicians or nursing staff), years of experience with *Bryophyllum* preparations, and the department(s) in which they worked.

### Data Collection

On April 8, 2022, an initial email containing the RedCap link was sent to all 266 potential participants (102 physicians of all hierarchical levels, including interns, and 164 nurses). Subsequently, on April 27, 2021, and on May 16, two additional emails were sent as reminders for those who had not yet participated in the survey. On May 31, 2022, the survey was closed, and the link to the questionnaire was removed. The collected data were then downloaded into an Excel file (Microsoft Office Professional Plus 2016) and stored in a secure account at the "Klinik Arlesheim AG."

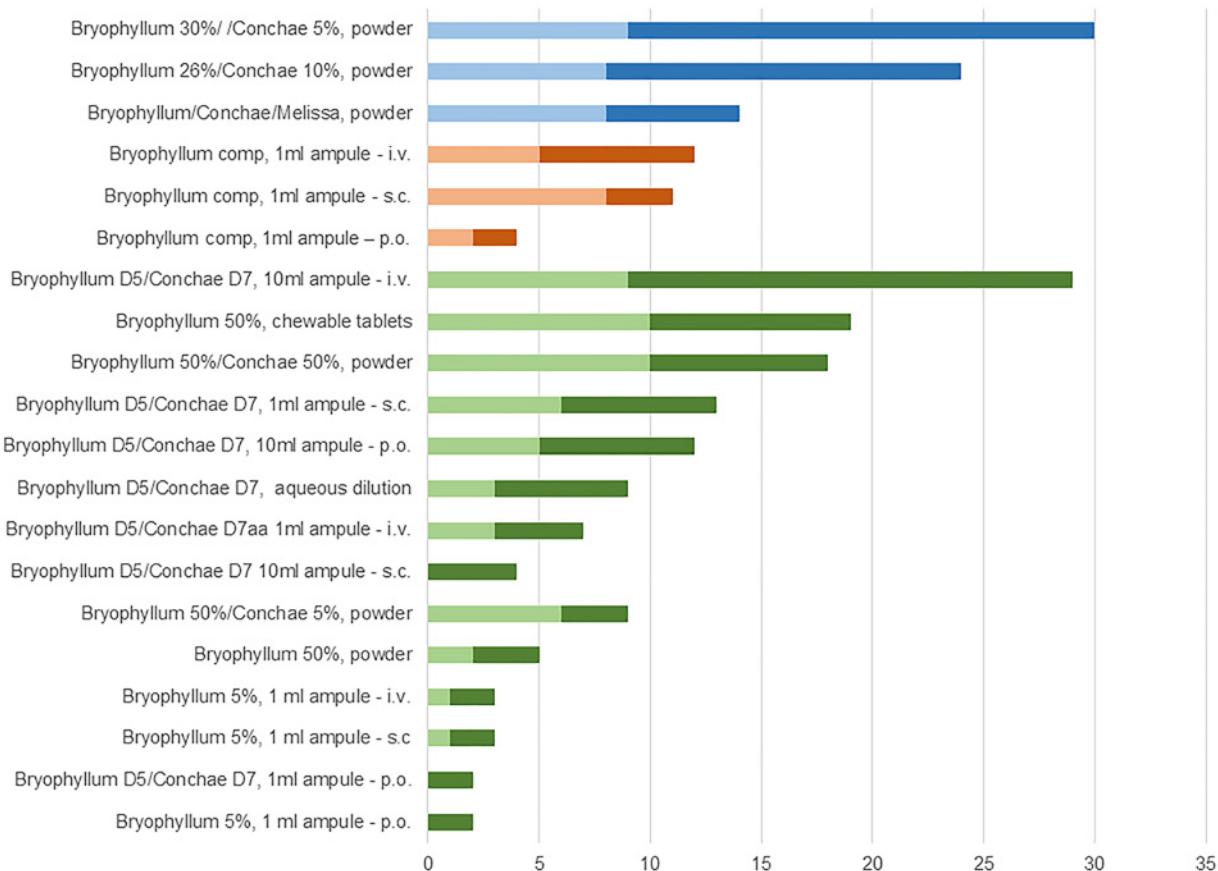
### Statistical Analysis

Descriptive statistical analyses were performed using the Statistical Package for the Social Sciences (version 26.0, IBM® SPSS® Statistics).

## Results

### Participants

During the 7.5-week period when the survey was online, 52 persons clicked the link to the questionnaire (out of 266 addressees). Of these, 48 participants started to answer some questions, and 36 answered all questions (response rate between 48/266, 18.0%, and 36/266, 13.5%). Each of two email reminders sent during the survey period resulted in a slight increase in the number of participants.



**Fig. 1.** *Bryophyllum* preparations most frequently used by the survey participants. Preparations shown were mentioned by at least two participants as having been used “very frequently”; see online supplementary information for answers on all preparations. In the case of ampules, the three possible application forms (i.v., s.c., and p.o.) were

considered separately. Light colours show number of participants answering “frequently,” strong colours “very frequently.” In blue, preparations from the hospital’s own production; in reddish-brown, from Wala (in both cases from *B. daigremontianum*); in green, preparations from Weleda AG (*B. pinnatum*).

As shown in Table 1, the participants had long experience with *Bryophyllum* preparations and were almost equally divided between physicians and nursing staff. They worked in various departments, including psychiatry/psychosomatics, oncology, outpatient services, and internal medicine.

#### Preparations Used

The participants used various *Bryophyllum* preparations from the hospital’s own production and Wala Heilmittel GmbH (both produced from the species *B. daigremontianum*), as well as from Weleda AG (from the species *B. pinnatum*). The numbers of participants who answered the questions about each of the preparations mentioned can be found in online supplementary Table 1 (for all online suppl. material, see <https://doi.org/10.1159/000536015>). If a prepara-

tion had multiple possible application forms, each form was considered separately. As shown in Figure 1, the preparations that most participants had used (very) frequently included *Bryophyllum 30% / Conchae 5%*; *Bryophyllum 26% / Conchae 10%* and *Bryophyllum / Conchae / Melissa* (all three as powder and from the hospital pharmacy); *Bryophyllum comp, 1 mL ampule administered i.v., s.c., or p.o.* (from Wala Heilmittel GmbH); *Bryophyllum D5 / Conchae D7, 10 mL ampule – i.v.*; *Bryophyllum 50%, chewable tablets*; *Bryophyllum 50% / Conchae 50%, powder*; *Bryophyllum D5 / Conchae D7, 1 mL ampule – s.c.*; *Bryophyllum D5 / Conchae D7, 10 mL ampule – p.o.*; *Bryophyllum D5 / Conchae D7, aqueous dilution*; *Bryophyllum D5 / Conchae D7aa 1 mL ampule – i.v.*; *Bryophyllum D5 / Conchae D7 10 mL ampule – s.c.*; *Bryophyllum 50% / Conchae 5%, powder*; *Bryophyllum 50%, powder*.

**Table 2.** Diagnoses for which *Bryophyllum* preparations are prescribed ( $n = 36$ )

Diagnosis	How often have you administered <i>Bryophyllum</i> for the following diagnoses?				
	never	rarely	occasionally	frequently	very frequently
Anxiety	1	2	3	8	22
Sleep disorders	2	3	5	11	15
Crisis situation in oncology	12	4	0	6	14
Posttraumatic stress disorder	4	2	7	10	13
Benzodiazepine addiction/withdrawal	12	4	4	4	12
Depression	9	0	5	11	11
Alcohol addiction	18	2	4	5	7
Drug addiction	20	1	4	4	7
Personality disorder	11	6	4	10	5
Restless legs syndrome	11	7	5	8	5
Hypomania	19	3	3	7	4
Psychosis/schizophrenia	13	7	5	8	3
Attention deficit hyperactivity disorder	17	3	7	6	3
Dementia	14	2	13	4	3

*Bryophyllum* 5%, 1 mL ampule – i.v.; *Bryophyllum* 5%, 1 mL ampule – s.c.; *Bryophyllum* D5/*Conchae* D7, 1 mL ampule – p.o.; and *Bryophyllum* 5%, 1 mL ampule – p.o. (from Weleda AG).

#### Indications and Perceived Effectiveness

The most common indications for which participants used *Bryophyllum* preparations “very frequently” (10 or more answers) were anxiety, sleep disorders, crisis situations in oncology, posttraumatic stress disorder, benzodiazepine addiction/withdrawal, and depression (see Table 2). In line with these indications, nearly all participants agreed that *Bryophyllum* can be used to reduce the intake of chemical sedatives or psychotropic drugs, and approximately half of the participants believed that *Bryophyllum* can replace these medications (Table 3). In addition to the indications mentioned previously, *Bryophyllum* preparations were also “frequently” prescribed for alcohol dependence, drug dependence, personality disorder, restless legs syndrome, hypomania, psychosis/schizophrenia, attention deficit hyperactivity disorder, and dementia (Table 2). *Bryophyllum* preparations were most frequently prescribed for the following symptoms: restlessness, panic attacks, fearfulness, tension, agitation state, difficulties falling asleep, difficulty sleeping through the night, tachycardia/palpitations, depressive mood, dissociative state, and restless legs (10 or more participants answering “frequently” or “most frequently”; see online suppl. Table 2). When asked which improvements they “frequently” or “very frequently” noticed in their patients, many survey participants mentioned relief from restlessness, decreased anxiety, balance, easier falling asleep, better

**Table 3.** Opinions on *Bryophyllum* versus chemical sedatives or psychotropic drugs ( $n = 36$ )

In your opinion, can <i>Bryophyllum</i> replace chemical sedatives or psychotropic drugs?	
Yes	15
No	14
I don't know	7
In your opinion, can <i>Bryophyllum</i> reduce the administration of chemical sedatives or psychotropic drugs?	
Yes	34
No	1
I don't know	1

sleeping through, increased resilience, mood elevation, and reduced urge to move one's legs (as reported in Table 4).

#### Tolerability and Reported Adverse Reactions

The overall feedback on the tolerability of different application forms and products was mostly positive (see Table 5). Most participants answered the question about tolerability with “good” or “very good.” In addition, no participant reported very frequent or frequent side effects (see Table 6). When participants were asked to report any perceived occasional adverse reactions, the most commonly reported ones were irritation of the stomach or intestine, followed by daytime fatigue, drowsiness, diarrhoea and nausea. Poor concentration, restlessness, dry throat, dizziness, constipation, headache, and itching were reported by several participants to occur rarely. No participant reported additional possible adverse reactions that might have been caused by *Bryophyllum* preparations. If any such reactions had been reported, the name of the preparation associated with the adverse reaction could have been mentioned as well.

**Table 4.** Improvements observed in patients by the survey participants after administration of *Bryophyllum* preparations (*n* = 36)

Improvement	What improvements have you noticed in patients after administration or were reported to you by the patients?					
	never	rarely	occasionally	frequently	very frequently	I don't know
Easing of restlessness	0	0	2	13	20	1
Fading anxiety	0	0	5	11	19	1
Balance	0	0	8	19	8	1
Easier to fall asleep	1	1	6	19	7	2
Better sleeping through	1	1	10	13	7	4
Increased resilience	1	4	6	18	3	4
Mood brightening	0	7	8	16	3	2
Less urge to move legs	4	7	6	9	3	7

**Table 5.** Tolerability of various *Bryophyllum*\* preparations and application forms (*n* = 36)

Application form	Please indicate the general tolerability of the different application forms of <i>Bryophyllum</i>				
	bad	rather good	good	very good	I don't know
Ampules i.v.	0	1	5	26	4
Powder	1	3	8	21	3
Chewable tablets	0	1	10	20	5
Drops	0	2	12	18	4
Ampules p.o.	0	3	8	18	7
Ampules s.c.	0	3	11	18	4
Globules	0	2	3	16	15

\*All preparations taken together.

**Table 6.** Frequency of perceived side effects (*n* = 36)

Side effect	To your knowledge, how often do the following side effects occur?				
	never	rarely	occasionally	frequently	very frequently
Irritation of stomach or intestine	25	5	6	0	0
Daytime fatigue	23	10	3	0	0
Drowsiness	27	6	3	0	0
Diarrhoea	30	3	3	0	0
Nausea	27	7	2	0	0
Poor concentration	30	5	1	0	0
Restlessness	30	5	1	0	0
Dry throat	29	7	0	0	0
Dizziness	31	5	0	0	0
Constipation	32	4	0	0	0
Headache	33	3	0	0	0
Itching	32	3	0	0	0

## Discussion

### Main Findings

The survey reveals that various *Bryophyllum* preparations from the pharmacy of the "Klinik Arlesheim AG," Wala Heilmittel GmbH (in both cases produced from

*B. daigremontianum*), and Weleda AG (from *B. pinnum*) were prescribed or administered by participants. In terms of effectiveness, improvements were "frequently" or "very frequently" noted in relief from restlessness, decreased anxiety, balance, easier falling asleep, better sleeping through, increased resilience, mood elevation,

and less urge to move one's legs. Almost all participants agreed that *Bryophyllum* can be used to reduce the intake of chemical sedatives or psychotropic drugs. The tolerability of *Bryophyllum* preparations when administered per p.o., s.c., or i.v. was mostly very good, although occasional side effects such as irritation of the stomach or intestine, daytime sleepiness, drowsiness, diarrhoea, nausea were reported by some participants.

### **Strengths and Limitations**

One strength of the survey is that most participants had had ample opportunity to observe reactions to treatments with *Bryophyllum* preparations, with only four participants having experiences of less than 1 year. A limitation of the study is the low number of participants ( $n = 36\text{--}48$ ) and the response rate of 13.5–18.0%. This might derive from various factors, including the very high work load of the hospital physicians and nurses. Moreover, high personnel fluctuation and the presence of interns (typical for a teaching hospital) might have resulted in a high proportion of professionals with only minor previous experience with *Bryophyllum*, and who therefore did not feel confident enough to answer the questionnaire.

### **Comparison with Previous Prescription Patterns and Survey**

In a previous study characterising the prescribing pattern of *Bryophyllum* preparations in a network of 38 anthroposophic physicians in Germany between 2004 and 2010, diagnoses were coded according to the 10th revision of the International Classification of Diseases (ICD-10) [2]. The results revealed that the majority of the 4,038 prescriptions for *Bryophyllum* preparations were to treat "mental and behavioural disorders" (F00–F99, 35.7%), and "diseases of the skin and subcutaneous tissue" (L00–L99, 16%), "symptoms, signs, and abnormal clinical and laboratory findings, not elsewhere classified diseases" (R00–R99, 15.2%) and "diseases of the nervous system" (G00–G99, 9.7%). Among the diagnosis categories, the most frequently prescribed *Bryophyllum* preparations were for pruritus (L29), sleep disorders (G47), depressive episodes (F32), and other anxiety disorders (F41). These findings are consistent with the results of our survey. Given the increasing demand for natural products that are well tolerated and serve as alternatives to synthetic psychotropic medication, hypnotics, and sleep-inducing drugs, these results deserve further attention.

In 2018, a comparable survey was conducted among the 23 nurses from the departments of psychiatry and psychosomatics at the "Klinik Arlesheim AG" (response rate: 64%; data not shown). The responses motivated the authors to improve several aspects of the questionnaire and to carry out the current survey. In the earlier survey, as in the current one, the most commonly treated diagnoses with *Bryophyllum* preparations were anxiety disorder, depression, and drug dependence. The earlier survey results indicated that *Bryophyllum* was frequently used for symptoms of restlessness, with anxiety and panic attacks being commonly mentioned by most participants. Furthermore, the preparations, including those for intravenous applications, were generally well tolerated. A comparison between the two surveys revealed an increase in the use of *Bryophyllum* 50% chewable tablets over recent years.

One can assume that most medications prescribed by physicians of the "Klinik Arlesheim AG" are purchased by the patients at the hospital's pharmacy. In an attempt to find out which *Bryophyllum* preparations the participants had probably prescribed or administered, accounting data from the pharmacy of the "Klinik Arlesheim AG" were analysed (internal prescriptions only, last 10 years; data not shown). The most frequently sold solid preparations (exclusively for p.o. application) were, in descending order, *Bryophyllum* 30%/Conchae 5%, *Bryophyllum* 26%/Conchae 10%, *Bryophyllum*/Conchae/Melissa (all three from the hospital's own production), *Bryophyllum* 50% chewable tablets, and *Bryophyllum* 50%/Conchae 50% (both from Weleda AG). The number of solid *Bryophyllum* preparations from the hospital's own production increased from 2012 to 2022 from 3,962 units of 50 g–5,718 units (all three combined preparations with conchae). Nevertheless, the consumption of *Bryophyllum* 50% tablets increased more markedly in the period 2012–2022, from approximately 80 packages of 50 g per year to 2,832 in 2022. The most frequently sold ampules consisted of *Bryophyllum* D5/Conchae D7 (5 × 10 mL, from Weleda AG); their sales increased from 1,047 to 2,295 boxes per year.

### **Conclusion**

According to the healthcare professionals who participated in the current survey, *Bryophyllum* preparations are considered an effective and well-tolerated treatment for various mental disorders, often for anxiety. The ongoing clinical trials focussing on anxiety symptoms (NCT04825171 and NCT05110599) are therefore awaited with interest. *Bryophyllum* may be particularly beneficial for vulnerable populations, including pregnant women and children, as well as patients who require polypharmacy, by offering the possibility of reducing the dosage of synthetic drugs.

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## Statement of Ethics

The collected data did not involve specific patient information and thus fell outside the scope of the Swiss Federal Law on Data Protection (Human Research Act, Article 2). As a result, no special authorisation was required. The email sent to the employees explained that the anonymous survey would be used for research purposes and that participation was completely voluntary and non-coercive. Responding to the questions was taken as consent to participate in the survey under the given conditions. Ethical approval was not required for this study in accordance with local/national guidelines. Written informed consent from participants was not required in accordance with local/national guidelines.

## Conflict of Interest Statement

Some of the *Bryophyllum* preparations investigated in this study originate from in-house production of the “Klinik Arlesheim AG,” and all three authors are employees of this hospital. Dr. Daniel Krüerke and PD Dr. Phil II Ana Paula Simões-Wüst have received research funding from Weleda AG over the past 5 years.

## References

- 1 Fürer K, Simões-Wüst A, von Mandach U, Hamburger M, Potterat O. *Bryophyllum pinnatum* and related species used in anthroposophic medicine: constituents, pharmacological activities, and clinical efficacy. *Planta Med.* 2016;82(11–12):930–41.
- 2 Simões-Wüst AP, Jeschke E, Mennet M, Schnelle M, Matthes H, von Mandach U. Prescribing pattern of *Bryophyllum* preparations among a network of anthroposophic physicians. *Complement Med Res.* 2012; 19(6):293–301.
- 3 Daub E. Vorzeitige Wehentätigkeit. Ihre Behandlung mit pflanzlichen Substanzen, eine klinische Studie. Stuttgart: Urachhaus; 1989.
- 4 Hassauer W, Schreiber K, von der Decken D. Ein neuer Weg in der tokolytischen Therapie. *Erfahrungsheilkunde.* 1985;34:683–7.
- 5 Fürer K, Simões-Wüst AP, Winkler A, Amsler N, Schnelle M, von Mandach U. The application of *Bryophyllum pinnatum* preparations in obstetrics and gynaecology: a multicenter, prospective observational study. *Complement Med Res.* 2015;22(4):231–6.
- 6 Plangger N, Rist L, Zimmermann R, von Mandach U. Intravenous tocolysis with *Bryophyllum pinnatum* is better tolerated than beta-agonist application. *Eur J Obstet Gynecol Reprod Biol.* 2006;124(2):168–72.
- 7 Betschart C, von Mandach U, Seifert B, Scheiner D, Perucchini D, Fink D, et al. Randomized, double-blind placebo-controlled trial with *Bryophyllum pinnatum* versus placebo for the treatment of overactive bladder in postmenopausal women. *Phytomedicine.* 2013;20(3–4):351–8.
- 8 Mirzayeva N, Forst S, Passweg D, Geissbühler V, Simões-Wüst AP, Betschart C. *Bryophyllum pinnatum* and improvement of nocturia and sleep quality in women: a multi-centre, non-randomised prospective trial. *Evid Based Complement Alternat Med.* 2023;2023:2115335.
- 9 Santos S, Haslinger C, Klaic K, Faleschini MT, Mennet M, Potterat O, et al. A bufadienolide-enriched fraction of *Bryophyllum pinnatum* inhibits human myometrial contractility in vitro. *Planta Med.* 2019;85(5):385–93.
- 10 Bachmann S, Betschart C, Gerber J, Fürer K, Mennet M, Hamburger M, et al. Potential of *Bryophyllum pinnatum* as a detrusor relaxant: an in vitro exploratory study. *Planta Med.* 2017;83(16):1274–80.
- 11 Santos S, Zurfluh L, Mennet M, Potterat O, von Mandach U, Hamburger M, et al. *Bryophyllum pinnatum* compounds inhibit oxytocin-induced signaling pathways in human myometrial cells. *Front Pharmacol.* 2021;12:12.
- 12 Lambrigger-Steiner C, Simões-Wüst AP, Kuck A, Fürer K, Hamburger M, von Mandach U. Sleep quality in pregnancy during treatment with *Bryophyllum pinnatum*: an observational study. *Phytomedicine.* 2014; 21(5):753–7.
- 13 Simões-Wüst AP, Hassani T, Müller-Hübsenthal B, Pittl S, Kuck A, Meden H, et al. Sleep quality improves during treatment with *Bryophyllum pinnatum*: an observational study on cancer patients. *Integr Cancer Ther.* 2015;14(5):452–9.
- 14 von Manitius S, Flügel D, Gievers Steinlein B, Schnelle M, von Mandach U, Simões-Wüst AP. *Bryophyllum pinnatum* in the treatment of restless legs syndrome: a case series documented with polysomnography. *Clin Case Rep.* 2019;7(5):1012–20.
- 15 Yemitan OK, Salahdeen HM. Neurosedative and muscle relaxant activities of aqueous extract of *Bryophyllum pinnatum*. *Fitoterapia.* 2005;76(2):187–93.
- 16 Pal S, Sen T, Chaudhuri AKN. Neuro-psychopharmacological profile of the methanolic fraction of *Bryophyllum pinnatum* leaf extract. *J Pharm Pharmacol.* 1999;51(3): 313–8.
- 17 Martins Fernandes Pereira K, Calheiros de Carvalho A, André Moura Veiga T, Melgoza A, Bonne Hernández R, dos Santos Grecco S, et al. The psychoactive effects of *Bryophyllum pinnatum* (Lam.) Oken leaves in young zebrafish. *PLoS One.* 2022;17(3): e0264987.
- 18 Wagner H, Lotter H, Fischer M. Die toxischen und sedierend wirkenden Bufadienolide von *Kalanchoe daigremontiana* HAMET et PERR. *Helv Chim Acta.* 1986;69(2): 359–67.
- 19 Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap)-A metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform.* 2009;42(2): 377–81.
- 20 Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O’Neal L, et al. The REDCap consortium: building an international community of software platform partners. *J Biomed Inform.* 2019;95:103208.

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## Author Contributions

All authors contributed to survey conception and data acquisition. Daniel Krüerke performed the preliminary survey in 2018 and analysed the corresponding data. Tiffany Huber programmed the survey in REDCap. Tiffany Huber and Ana Paula Simões-Wüst wrote the manuscript. Ana Paula Simões-Wüst analysed the survey data, and Daniel Krüerke analysed the accounting data. All authors contributed to data interpretation, revised the manuscript critically, and approved the final version to be published.

## Data Availability Statement

Data are available from the corresponding author on reasonable request.